



**LAKE STURGEON “*NAMAO – BUFFALO OF THE WATER*”
IN THE SOUTH SASKATCHEWAN RIVER**

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SEAWA Watershed Report 2010-8 *draft*

SEAWA Web-based State of the Watershed Report

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Introduction: The Buffalo of the Water - Numao

The story of the Lake Sturgeon is a unique one. The story unfolds around the aboriginals and the early settlers of Canada.

The Buffalo of the Water, Numao, the name the Chipewyan natives called them were important for food and other products. The early settlers did not find a use for sturgeon, until the commercial fishing ventures in the late 1800's. The population of the sturgeon fell after overharvesting of the Great Lakes and the rivers. Today these species are noted as a sport fish across Canada and are managed under Fisheries Acts.

It is interesting to note that not only in Canada but all over the northern hemisphere the sturgeon are slowly fading from their once magnificent numbers to being extirpated in some regions. Fisheries management and monitoring are key to preserving the sturgeon within the watershed area. Excess heavy metals, endocrine disruptors, and other source contamination are a concern for bioaccumulation of toxicity within the fish species. Low water flows can contribute to loss of habitat and reduced fish numbers. Education, new technology and information must continue so we can keep sustainable numbers not only for sturgeon but also other fish.

The South Saskatchewan River rolls through the prairie, a semi-arid desert filled with various wildlife. The plains support agriculture, oil and gas industries, the City of Medicine Hat, the municipality of Cypress County and the reserve of Suffield, which includes a military base. Far beneath the gentle flowing waters is a native to this area that has little changed its appearance in the millions of years that it has lived here. The Lake Sturgeon, (*Acipenser fulvescens*) (Rafinesque 1817), a species of fish, with a pedigree which dates back to the late [Jurassic](#) (about 150 million years ago) to the Pleistocene epoch (2 million to 10,000 years ago). These living fossils are found in the northern hemisphere and are found most exclusively in freshwater as compared to other sturgeon which are [anadromous](#) or spend time in both freshwater and marine water

According to Ludwig, Sturgeon is purportedly the most threatened vertebrate group on the planet (Findlay, 2008) Producers of coveted black caviar, the eggs of the female, sturgeons are one of the most valuable wildlife commodities on earth. The group is among the most endangered fishes with all species listed under Convention on International Trade in Endangered Species (CITES) Appendix I (two species) or II (25 species), only two species considered Lower Risk by IUCN. (E.K. Pikitch et al, 2005)

No one has a clear idea of how many Lake Sturgeon we have left but it is estimated that only 700 mature individuals are left in Alberta. Alberta has two subpopulations of lake sturgeon, in the North and South Saskatchewan River systems. These two subpopulations remain isolated from each other due to the building of the [Gardiner Dam](#) on the South Saskatchewan River. (SRD, 2009) The last survey of the sturgeon population of the South Saskatchewan River population was conducted in 2000.

The sturgeon of the South Saskatchewan River are listed as Threatened under the provincial Wildlife Act in December 2007, and the species is being considered for federal listing as Endangered in western Canada, under the Species At Risk Act (SARA).

Since 2004 the Alberta Government has put in place a catch and release policy on lake sturgeon in the South Saskatchewan River system (Clayton, 2010). Several agencies – Alberta Environment, Alberta Sustainable Resource Development and Fisheries and Oceans Canada all share the responsibility in managing our watershed system for sustainable development. Together the provincial and federal government are determined to manage all of our natural capital within our watershed basin. The South East Alberta Watershed Alliance (SEAWA) is a non-profit regional organization within a network of watershed planning and advisory councils that understand, plan and initiate good stewardship and public participation within Alberta. Protection of fish habitat is particularly important in Alberta because there is a shortage of fish-producing habitat, especially in the settled areas of the province. Demand for fish exceeds the supply of fish. Sustaining the supply of fish through maintenance of habitat and habitat productivity is essential to balance the supply-demand relationship. (Development, 1998)

The fact that a sturgeon has a cartilaginous skeleton as compared to a bony fish is confusing, because the taxonomic Superclass group of fish that it belongs to is the [Osteichthyes](#), a group of fish that have bones instead of cartiligenous skeleton! The sub class Actinopterygii is the ray-finned, with the pairs of fins that are webs of skin supported by horny rays. The primitive ray-finned group still survives in the form of three aberrant types. Two, the sturgeons and paddlefishes (both represented in North America), [Chondrosteans](#), are rather degenerate. They have lost the ganoid scale covering of their ancestors. Scales may still be present on the tail but the paddlefish has otherwise only a naked skin and the sturgeon a partial armour of rows of plain bony plates. (Romer, 1977) The sturgeon, more noticeably on the young are covered with five rows of armoured plate, called scutes instead of scales. [Scutes](#) are made up of the same material that is found on turtles, alligators or chicken legs! The bony type armour with hooks is eventually rounded off in the older fish. This serves as protection for the young from other fish eating picevores. The rest of the skin of the sturgeon is like leather.



Photo courtesy of Wisconsin, Department of Natural Resources

These living dinosaurs can live to well over 100 years, one caught in Manitoba was said to be around 150 years old and lengths of up to 150 cm and weigh as much as 100 kg. The Alberta angling record for lake sturgeon is 47.7 kg.

The shark and the sturgeon have some similarities including the upright tail and upper dorsal fin. That is where the similarities end as the sturgeon has no teeth, instead has a large sucking ventral mouth that feeds off the bottom of the river. The four barbels or appendages that look like whiskers are sensory appendages that help locate its food in the muddy bottom (Romer, 1977). Some of the food that this fish eats is crayfish, mollusc, insect larvae, nymphs, fish eggs, fishes (rarely) nematodes, leeches, amphipods, decapods and a few plants. (Crossman, 1973).

The sturgeon has been observed projecting from the water in much the same way a porpoise or whale breaches the water. They shoot straight up from the water and land on their sides. This behaviour is thought to be air gulping, due to the physostomous swim bladder. The swim bladder is like a ballast tank in a submarine, let air out and the boat sinks, air in means it would float. Physostomous is also used as a lung in some fish, especially in low oxygen or shallow waters. Certain fish will breach the surface to gulp in oxygen. Others believe that it is just the sturgeon showing off to other sturgeon or mating behaviour.

The habitat for the lake sturgeon is diverse with a natural variation of flow, high water quality and a broad prey base. Different types of habitat are required for spawning, development of

eggs and larvae, growth of juveniles, as well as feeding and overwintering of adults (Earle, 2002).

Sturgeon are a cool water species preferring temperatures around 19-25°C. Spawning takes place around 17°C at water temperatures. A decrease in water temperature can delay spawning. The lake sturgeon usually is found at depths of 5-10m, or deeper depending on the river. They are found in slower moving rivers and spawning sites are usually fast-flowing waters of 0.6-5 m in depth over hardpan clay, sand, gravel, rubble, cobble or boulders. Young have been observed resting on sand bars.

Maximum lifespan in Alberta has been recorded at 78 years, whereas maximum lifespan in Canada is 154 years. The sturgeon are slow to mature and in the Saskatchewan River females mature around 25 years of age at weights of 13.6 kg and lengths of 1.3 m. and males maturing earlier at 19 at smaller sizes. With a female only spawning every 4 to 7 years, the number of adult spawning is greatly reduced. The mortality of the young depends on access to spawning ground, proper habitat and predator prey relationship with other fish that eat young larvae or fries.

During spawning in the spring the total number of eggs varies from ~50,000 in a 5.2 kg. female to over 1,000,000 in very large fish. Egg incubation requires 7-10 days in water temperatures of 13-15°C; after hatch, the negatively buoyant larvae move relatively little in the water column. After hatching and absorbing the yolk sac, the larvae feed, growing rapidly longer until sexual maturity when they grow heavier. (Committee on the Status of Endangered Wildlife in Canada (COSEWIC), 2006)

Historically the sturgeon was used as a food source for the aboriginals. The fish was allowed to age for two days prior to eating unlike other fish that should be ate immediately. The [isinglass](#) from the swim bladder of the sturgeon was used as the finest quality of glue and was almost pure gelatin. The swim-bladder was removed, cleaned and dried in sheets. Even in Roman times, isinglass was highly valued and by 1905 it retailed for \$3.00 a pound. Today it is sold to the Europeans who use it for a stabilizer in making wine and beer. About 2.2 per cent of the European population is reported to have a fish allergy due to the levels of fish by-products found in beer clarified with isinglass. Guinness (among many other breweries) uses isinglass, which is essentially collagen that causes the yeast and other particulates to clump and settle out of the beer. (SOPINKA, 2007)

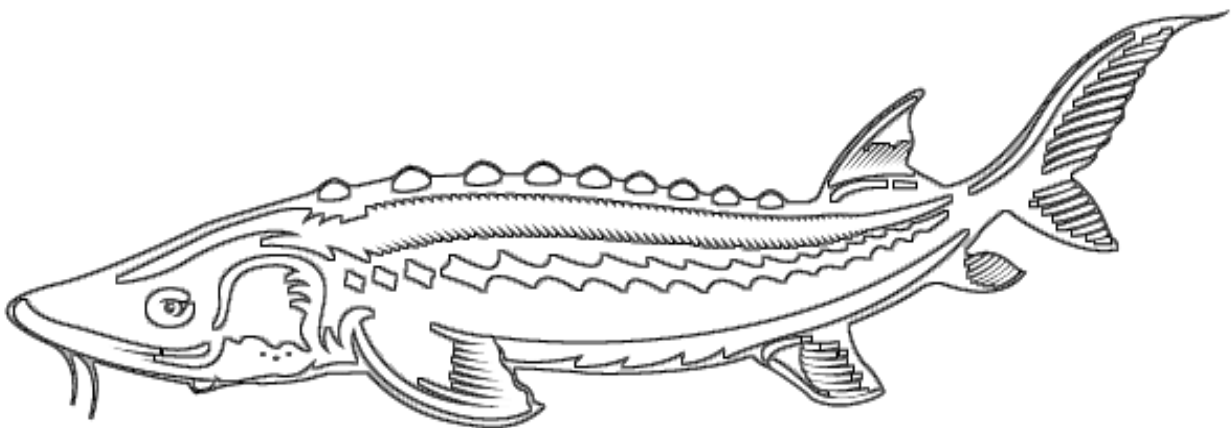
The value of sturgeon products included: (1) caviar; (2) isinglass; (3) the flesh salted, smoked; (4) oil for the leather industry; (5) fertilizer made from entrails and scrap; (6) the soft grisly backbone with its sheath which prepared was called wesinga and in Russia was an esteemed article of diet; (7) the brain and nerve cord removed from the gristle when smoked and dried was considered a great delicacy in China; (8) the back portion of the sturgeon or dorsal region was made into a food product called balyki; (9) the ventral part or belly of the fish was made into a food called pupki; (10) a valuable fish glue, differing from isinglass, was made from the

nose, fins, tail; and (11) the skin produced leather for mill belts and boot laces. Most settlers found the taste of sturgeon unagreeable.

Ojibway subsistence fisheries of the mid-19th century provide the only numerical estimate of the historical Aboriginal lake sturgeon harvest. During this time, fresh and dried sturgeon meat, as well as isinglass, a gelatinous material procured from the dried inner membrane of the sturgeon [swim bladders](#), became important commercial by-products of the subsistence fisheries that were traded to the Hudson's Bay Company (HBC). The HBC isinglass trade records have been used to estimate the traditional harvest of lake sturgeon by the Ojibway in the Lac Pluie district. Between 1823 and 1885, records estimate an average yield of nearly 141,210 kg of fish/yr. The harvest was estimated to between 74 and 319 fish in 2002 (Committee on the Status of Endangered Wildlife in Canada (COSEWIC), 2006).

Mounting concern about sturgeons and paddlefishes led to the 1997 listing of all species under the Convention on International Trade in Endangered Species (CITES), a voluntary international agreement between governments protecting species threatened by trade and the most significant international act protecting sturgeons and paddlefish. International trade in CITES protected species is accomplished through a trade permit system, for species threatened with extinction and species of concern.

Assessment of the Lower Red Deer River near Buffalo and Bindloss, toward the confluence with the South Saskatchewan River near the Alberta-Saskatchewan border revealed a significant decline of fish from a survey done in 1990-1991 to the year 2004. From an average of 25.5 fish/km in 1990-1991 to 5.3 fish/km in 2004 (Blackburn, J., and J. Cooper., 2006). The survey was done by jet boat electrofishing which doesn't always work for deeper dwelling fish. (Blackburn, J., and J. Cooper., 2006)



cosewic



Figure 56. Nearly a half-million anglers enjoy fishing in Alberta's waters each year, a dramatic increase over the last 10 years. This increased pressure, however, requires that our fisheries resource be well-managed. Photo courtesy of Alberta Tourism.

(Fish Conservation in Alberta 2006-2010)

Albertans are very interested in the fisheries resource of the province ([Fig. 56](#)). An indication of the importance of this resource can be seen in the data on the numbers of people who participate in angling in the province. A survey conducted in 1985 indicated that nearly 450,000 individuals spent an average of 17 days fishing per year, for a total of 7.6 million "fishing days". These numbers represent a substantial increase over the last decade. Because of this high level of interest, and the pressure that this interest places on the fisheries resource, the resource must be well-managed. Although some people involved in sport or commercial fishing are primarily interested in increasing or decreasing the numbers or sizes of fish, depending on whether or not a particular species is considered desirable, the fishery biologist is interested in understanding and quantifying the roles of fishes in the functioning of a lake ecosystem (Tonn, 2004-2005).

[Catch and release](#) for the sturgeon can be potentially damaging due to bruising or loss of eggs if the fish is squeezed while trying to bring the fish onboard. The circle barbless hook is probably the better hook to use as the most damaging of all fishing methods has been shown to be bait fishing using "J" hooks, because of the tendency of fish to try to swallow the stationary natural food material. Keeping the fish under water while releasing the hook or as soon as possible will keep the fish from exhaustion and better odds of surviving. When pictures need to be taken the best way is to keep it in the water as much as possible and holding it by the gills is not recommended.

R.L.&L. Environmental Services Ltd. 1992 report for sport fisheries in Alberta, prepared for World Wildlife Fund/Prairie for Tomorrow and Alberta Fish and Wildlife Division, noted that Habitat management and protection recommendations included designating the Grand Forks location as a sanctuary, identifying and mapping spawning and nursery sites used by lake sturgeon in Alberta, identifying other possible critical habitats and concentrations of sturgeon and monitoring them for signs of stress, identifying flow and physical/chemical habitat requirements for critical locations on the North and South Saskatchewan rivers, and identifying the impact of water management/flow relationships on sturgeon habitat. In the 1997 report by R.L.&L. showed that overharvesting of older fish and concluded that lake sturgeon were harvested near maximum allowable limits from 1980-1990.

Discharge from wastewater treatment plants affects rivers through increases in bacteria levels and nutrients. Excessive plant growth as a result of increased nutrient levels blocks sunlight decreases the available oxygen and alters the composition of the natural river ecosystem. However the introduction of discharge disinfection and nutrient reduction in 1998 has resulted in reduced bacteria and phosphorus levels downstream of the City of Edmonton. Calgary, Lethbridge, Medicine Hat and Red Deer are all located on the South Saskatchewan River system and extensively manipulate waters for consumptive uses. High water demands on the South Saskatchewan River may lead to increasingly low water levels which would reduce the amount of suitable overwintering habitat, deep congregation pools and high-velocity spawning habitat. (Earle, 2002) According to Grayson Mauch, City of Medicine Hat employee, our wastewater treatment has to follow under the federal guidelines for wastewater treatment. The city has recently updated the water plant to include ultra violet disinfection so limiting the chlorine gas that would have been used to keep down coliform count or bacteria count in the water. There is also a process of phosphorous and ammonia removal from the water before it is returned back to the river system.

In Canada, all levels of government share the responsibility for managing the collection, treatment and release of wastewater effluent. The Government of Canada is responsible for managing the risks posed by substances listed under the [Canadian Environmental Protection Act, 1999 \(CEPA 1999\)](#) and for protecting fish and fish habitat from harm caused by deleterious

substances under the [Fisheries Act](#). Dam operations also affect food availability, nutrient status, and predator/prey relationships. Dam outflows warm the river during the winter and cool it during summer. As a result the seasonal temperature requirements of many invertebrates are not met and a large-scale macro-invertebrate depletion is common downstream of dams. Lehmkuhl documented a marked reduction in invertebrates downstream of Gardiner Dam on the South Saskatchewan River. Invertebrates are an important food source for lake sturgeon; therefore, low prey densities make foraging difficult and have detrimental effects on the growth rates of sturgeon. Changes in the annual hydrologic profile can also affect the cues used to trigger spawning. Natural flow regimes are important for maintaining healthy and productive river communities. (Earle, 2002)

Gas supersaturation below dams can cause significant mortality of sturgeon because of gas bubble disease. This can happen when too much water is released at once from a dam. Juvenile sturgeon is known to be sensitive to chemical pollutant. Their benthic feeding strategy coupled with the longevity of lake sturgeon increases vulnerability to bioaccumulation of toxic pollutants. High contaminant levels have resulted in closure of some commercial fisheries on the St. Lawrence and Ottawa rivers. (Earle, 2002)

Reduced water quality, habitat loss and degradation, and potential overharvest threaten the survival of lake sturgeon populations in Alberta. Sturgeon are more susceptible than most fish to overharvest because of their longevity, delayed maturation and periodic spawning. Because of these sensitivities, they may serve as an early indicator to ecosystem health and biodiversity. Historic population levels in Alberta are largely unknown. Within the past decade, numbers in the North Saskatchewan River appear to have increased. No recent estimates for the South Saskatchewan River are available, but existing numbers suggest the population may not be sustainable in its present state. The number of spawning fish in each subpopulation may be below critical numbers for genetic or demographic stability. Re-establishment of older age classes and consistent annual recruitment are essential for full recovery of the lake sturgeon population in Alberta. Current data including age-at-maturity, length and weight-at-age and a reliable population estimate are required to enable meaningful management decision (Earle, 2002)

In a 2002 Alberta Environment commissioned Golder Associates Ltd. (Golder) to conduct a qualitative "Strategic Overview of Riparian and Aquatic Conditions" (SORAC) of the mainstream rivers of the South Saskatchewan River Basin in southern Alberta. The report is an assessment based solely on a Best Judgement Panel. The conclusion of this report indicated that the Bow River Reach #1, which includes the Bow River from the Bassano Dam downstream to the 'Grand Forks' at the confluence with the Oldman River was listed as Degraded. Some of the issues included; (1) low flow, reduced sediment transport and increased temperatures, (2) limited irrigation return flows with some fertilizers, pesticides, and nutrients from feedlots, (3) cottonwood in the riparian zone is seriously degraded state as most are dead with little to no signs of recruitment. The South Saskatchewan River Reach # 2 includes the South Saskatchewan River from the 'Grand Forks' of the Bow and Oldman rivers to the WSC gauge in

Medicine Hat. Some of the issues include low flows, Medicine Hat footprint and its affects on stormwater runoff, quality and quantity (sewage, pesticides, fertilizers, etc.), winter grazing in riparian zones, cottonwood somewhat degraded. The South Saskatchewan River Reach #1 from the WSC gauge in Medicine Hat to the Alberta /Saskatchewan border. Issues include low flows during drought years, substantial oil and gas effects including water extraction below Medicine Hat and a lack of successful restoration work on pipeline water crossings, Medicine Hat footprint, winter grazing in riparian zones, serious impacts to the cottonwood from grazing and reduced flooding. (Golder Associates Ltd., 2003). Marbek resource consulting did a review of existing Municipal wastewater effluent (MWW) and found there are many gaps and overlaps between the municipal and federal government in bylaws and permits. For example no permit is needed to operate a municipal waste water effluent plant. In the matter of municipal bylaws, the municipality determines type and amount of effluent being discharged. The federal guidelines under the Fisheries Act and the Deleterious Substance Act should be met but are not necessarily exceeded. Who determines whether or not a substance should not be discharged is left up mainly to the municipal government. An example is pharmaceuticals expressed into the waterway. Some municipalities do not allow these types of endocrine disruptors into the water course, while other municipalities allow this. Inspection and compliance can be made by provincial or federal government as not all municipalities have their own bylaws monitored or enforced. ((CCME), 2005)



To meet this challenge, Alberta will continue to use good science and adaptive management, while following the “precautionary management principle” developed by the United Nations to address fish declines throughout the world. This consists of:

“...cost-effective measures and actions, including future courses of action, which ensure prudent foresight, reduce or avoid risk to the resources, the environment, and the people, to the extent possible, taking explicitly into account existing uncertainties and the potential consequences of being wrong.”

-Code of Conduct for Responsible Fisheries. 1995. Fisheries Dept, Inland Fisheries, Food and Agriculture Organization, United Nations. (Fish Conservation in Alberta 2006-2010)

The Forest - Fish Conference: Land Management Practices Affecting Aquatic Ecosystems included a study of instream structures that have been used to restore and improve fish habitat in streams of southwestern Alberta since the 1970's. Many of these projects were designed to create deepwater refuge, a habitat type considered to be a limiting factor to fish during low flow periods. They were used to: mitigate the effects of riparian or instream development; compensate for habitat lost during instream construction; restore the effects of historical land use activities; and enhance habitat for sportfish.

The conclusion of the study found that instream structures can have short-term habitat benefits during the period immediately following a localized stream disturbance. Structures must be appropriately located and designed if they are to withstand even minor flood discharges. Regular maintenance is required if they are to remain effective. However instream habitat structures should not be viewed as a long-term solution for the development of good fish habitat. Better design practices might improve performance, but experience indicates it is very difficult to restore a river once it has been severely altered.

A variety of channel processes are required to maintain a healthy stream. Over the long-term, stream health and habitat availability can only be achieved by preserving or re-establishing these processes. This might involve watershed-level restoration activities, limiting the amount of development in sensitive watersheds, and establishing appropriately sized riparian corridors. These kinds of activities require community cooperation, integrated planning and possibly the compensation of landowners for required changes in land use. This is much more complicated than merely placing a few logs or rocks in a stream channel. The challenge is to find ways to undertake this work in the extensive areas that require restoration. (Pattendon, 1998)

Some of the concerns for today and tomorrow that can affect the habitat of the river systems are chemicals from food and industrial production that is being leached into the waterways. A recent study conducted by two University of Calgary professors and reported in the Environmental Toxicology and Chemistry journal shows definite gender-bending in minnows that were found in 15 different locations in the Red Deer and Oldman rivers. This could have a huge impact on the food chain but at this point the information is still coming forward. Mercury contamination is found not just in the long lived sturgeon but other sport fish as well in the South Saskatchewan River Basin. This can cause mortality rates in the development of eggs and further bioaccumulation within the food chain. Contaminants that are not found in the water but are found accumulating in the substrate is a concern for benthic organisms or species that feed on the substrate could be bioaccumulating these substances. Environment Canada is directing studies with Alberta Environment to research various problematic sources of contaminants that are being deposited into the water source. Some examples are; anti-inflammatory drugs, musk, and other organic wastes. A provincial wide networking system for information on effluent needs to take place (Canada, 2009).

Use of exotic species within our watershed area are a concern should these introduced species reproduce and threaten the native populations. Certain species were introduced for man Grass carp are listed as a permitted species to stock in the province under the *Alberta Fisheries Act* (1997). Pond owners may obtain a "Recreational Fish Culture" application form (a \$10 application fee).

Triploid grass carp, Arctic char, brook trout, brown trout, rainbow trout and tiger trout are allowed as species acceptable for stocking in private farm ponds. A "Recreational Fish Culture" licence holder can buy grass carp, char and trout species noted above, but may not traffic or sell fish. Grass carp may not be stocked in the Restricted Area (East Slopes regions) of Alberta. Once stocked into a licenced pond, grass carp may not be legally moved to other locations. (Develoment, 2004).

Grass Carp (*Ctenopharyngodon idella*) is an introduced species from the northern hemisphere in Siberia and China that eat the vegetation by clipping near the substrate. These species and others are introduced to pressure on the eggs which cause triploidism, a mutation of a normal chromosomes sets of numbers to an increase of three sets of numbers which causes sterility (Develoment, 2004). Research of the *Acipenser Fluvescens* has shown they have 264 chromosomes and are triploid, which means their chromosome numbers are in a series of three instead of diploid series of two sets. The common carp, *Cyprinus Carpio*, a cousin to the grass carp are also triploid, which has given rise to the debate on whether or not the grass carp could potentially reproduce.

Since the 1960s when grass carp were imported to the United States, they are now widespread in 45 states through accidental and intentional release. In Canada, grass carp was introduced to Alberta in 1987 for research on the control of aquatic vegetation in irrigation canals. Since that time they have escaped to the wild. In Ontario, a grass carp was captured in 1985 in Lake Erie. Three more were captured in commercial fishing nets on separate occasions during 1989 and 1998 in southern Lake Huron. In the fall of 2003, a single grass carp was caught at the mouth of the Don River, Lake Ontario. It is believed that each capture was an isolated occurrence, likely an intentional release that was purchased from the live food fish industry. There is no known established population of grass carp in the Great Lakes at this time. (Hunters, Ontario Federation of Anglers and, 2010).

The Methuselah of the river, the buffalo of the river and the living dinosaur are some of the names that are associated with the Lake Sturgeon. The very fact of its old pedigree and old age shows us that it has the necessary genes for long life. With 264 chromosomes the river sturgeon has the ability to produce hybrids which in itself can continue its long life (Fontana, 2004). The females live longer than the males although since the sexual organs are internal there is no way of telling whether this fish is able to change its sexual identity. A concern for endocrine disrupters added to our waterways has recently come to a forefront in the news due to long-nosed dace in the Oldman river basin changing sexual identity and larvae that are deformed as reported in the *Environmental Toxicology and Chemical Journal* (Sanchez, 2010). There are many different ways in which our water becomes contaminated by gender-benders.

Pharmaceuticals being expressed into the waterways, acetylaldehyde from plastics, low oxygen levels (Hassell, 2003) and stress from mercury or heavy metal contaminations all contribute towards the unhealthy atmosphere in this reach of the South Saskatchewan River system. Perhaps an apt name for mercury exposure of the fish in this river basin should be called Mad Hatter disease, a disease found in those who made hats from the use of mercury. The sturgeon is not the only fish in this river that Health Canada has issued a warning regarding excess of mercury and ordered not to eat. No one is certain where the heavy metal contamination is sourced from but new methods to detect types of mercury and source are being introduced. The costs for samples that include endocrine disruptors are fairly expensive and Medicine Hat took part in sample studies conducted by Alberta Environment upstream from raw water intake.

CONCLUSION:

The numbers of sturgeon seem to be increasing due to the management effort of the Department of Fisheries and Oceans and their decision for a zero bag limit issued in 2004. Return flows from the South Saskatchewan in Alberta to Saskatchewan are near normal with a report soon coming out that will address flows of the rivers. The City of Medicine Hat is responding to upgrades demanded by Alberta Environment to reduce the amount of aluminum produced in cleaning river water for drinking water. These upgrades will cost close to thirty million dollars (Stevenson, 2010). The Alberta Environment has set more stringent measures for returned waste water to the river. The City is also introducing solar energy to create steam to run the power plant which should offset the cost to produce heated water and use less fossil fuel (Calgary, 2009). Increased pressure from licensed users is being monitored by the provincial government. Contaminants of the water way seem to be the real issue for sturgeon and other fish in the aquatic environment. Concern in how much pharmaceuticals are being returned into our waste water has led to awareness; new concepts and ideas for better treatment of water returned to the river and are currently being addressed by Alberta Environment (Environment, copyright 1995-2010). As a community we all need to take part in awareness of our aquatic environment so that these indicators of health of our fish are important indicators of our own health and what we can do to keep a clean habitat.



Fishing in the Medicine Hat area archived Medicine Hat Museum circa 1900

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The **South East Alberta Watershed Alliance (SEAWA)** was formed in 2007, incorporated as a non-profit society in 2008, and designated as the WPAC (Watershed Policy and Advisory Council) for the South Saskatchewan River sub-basin.

SEAWA Vision: A healthy watershed that provides balance between social, environmental and economic benefits.

SEAWA Mission: South East Alberta Watershed Alliance brings together diverse partners to plan and facilitate the sustainable use of the South Saskatchewan River Watershed for present and future needs.

SEAWA Members include interested individuals throughout the watershed along with our communities, ranchers, farmers, industries, companies, governments, conservation groups and educational institutions. We are proud to include the following among our founding members:

Government Sector: Alberta Government, City of Medicine Hat, Government of Canada, Cypress County, Palliser Health Region, Town of Redcliff, Town of Bow Island, and Special Areas Board.

Land Resource - Industry and Agriculture Sectors: St Mary River Irrigation District, Murray Lake Ranching, GG Bruins Farms, Short Grass Ranches, Canadian Fertilizers Limited, Redcliff Technology Enterprise Centre, Box Springs Business Park, and Canadian Centre for Unmanned Vehicles.

Academic, Research and Non-Governmental Organizations Sectors: Medicine Hat College, Alberta Research Institute, Red Deer River Watershed Alliance, and Hyperion Research.

Tourism and Conservation Sectors: Grasslands Naturalists, Canadian Badlands, and Medicine Hat Interpretive Program.

SEAWA Web-based State of the Watershed Report is managed by the *SEAWA State of the Watershed Committee (2010 members):*

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Grayson Mauch, *City of Medicine Hat Water and Wastewater*
Herb Scott, *Cypress County*
Stuart Murray, *Murray Lake Ranching*
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